

WHAT IS CLAIMED IS:

1 1. A system for coupling a high intensity focused ultrasound transducer to
2 a patient comprising:
3 a circuit for conveying a coupling fluid;
4 pump for circulating coupling fluid through the circuit;
5 a vacuum chamber connected to apply a pressure gradient to said circuit such
6 that dissolved gasses are drawn out of said coupling fluid; and
7 a coupling reservoir connected to said circuit for coupling a transducer to a
8 patient.

1 2. The system as described in claim 1 further comprising a chiller on said
2 circuit for cooling said coupling fluid.

1 3. The system as described in claim 1, wherein said vacuum chamber
2 comprises one or more gas permeable membranes through which gas may be drawn from said
3 fluid.

1 4. The system as described in claim 1, wherein the pump is also
2 connected to draw a vacuum in the vacuum chamber.

1 5. The system as described in claim 1, further comprising a control device
2 for adjusting said circulation pump.

1 6. The system as described in claim 1, further comprising one or more
2 sensors.

1 7. The system of claim 6, wherein said one or more sensors are in
2 electronic communication with said control device.

1 8. The system as described in claim 6, wherein said sensor(s) capable of
2 reporting information to an operator.

1 9. The system of claim 1, wherein said fluid is a coolant for controlling
2 the temperature of a transducer.

1 10. The system of claim 1, further comprising a storage tank located on
2 said circuit.

1 11. The system of claim 1, further comprising a means for reducing
2 pressure and volume fluctuations.

1 12. The system as described in claim 1, having one or more valves in said
2 circuit.

1 13. The system as described in claim 1, wherein said fluid is water.

1 14. An apparatus for performing high intensity focused ultrasound (HIFU)
2 procedures, the apparatus comprising:

3 a first housing having a high intensity focused ultrasound (HIFU) transducer;

4 a second housing having system electronics for controlling said transducer, a
5 user interface, a display and a power supply; and

6 a system for circulating a degassed coupling fluid wherein said coupling fluid
7 is circulated between said first housing and said second housing and said first housing and
8 said second housing are in electronic communication.

1 15. The apparatus as described in claim 14, wherein said system for
2 circulating a degassed coupling fluid further comprises one or more sensors in electronic
3 communication with said system electronics, and said system electronics able to operate as a
4 controller for said system for circulating a degassed coupling fluid.

1 16. The apparatus as described in claim 14, wherein the system for
2 circulating a degassed coupling fluid is a cooling system for dissipating heat from said high
3 intensity focused ultrasound (HIFU) transducer.

1 17. A method for performing ultrasound therapy, said method comprising:
2 applying an ultrasound transducer to a tissue surface of the patient;
3 energizing the transducer to emit ultrasonic energy to the patient;
4 circulating a coupling fluid to the transducer; and
5 applying a vacuum to the circulating coupling fluid to degas said fluid.